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NORTH AMERICAN AGARICS.

Genus *Russula* (*russulus*, reddish), Fr. Hym. Eur., p. 459.

By ROBERT K. MACADAM.

PART II.

III. RIGIDÆ.

12. "*R. LACTEA*, (Pers.) Fr. Hym. Eur., p. 443; Stev., B. F., p. 118; Sacc. Syll., Vol. v., p. 459. Pileus 2 inches (5 centimeters) broad, at first *milk-white*, then *tan-white*, throughout compactly *fleshy*, campanulate then convex, often eccentric without a pellicle, always dry (at first even, then slightly cracked when dry), margin straight, thin, obtuse, even; flesh compact, white. Stem $1\frac{1}{2}$ –2 inches (4–5 centimeters) long, $1\frac{1}{2}$ inches (4 centimeters) thick, solid, very compact, but at length spongy-soft within, equal, even, always white. Gills *free*, very broad, *thick*, distant, rigid, forked, white.

"Mild, the gills are at length adnate, forked at the base and apex. Care must be taken not to confound it with other *Russulæ* which have changed color and become white. In mixed woods. Uncommon. August.

"Name *lac*, milk. Milk-white. (Fr. Monogr., ii. p. 190; B. & Br., 1133; C. Hbk., n. 621; S. Mycol. Scot., n. 591; Ag., Pers. Krombh., t. 61, f. 1–2; Barla, t. 15, f. 1–13; Paul., t. 74, f. 2.)"—Stevenson.

Edible and of good flavor. North Carolina and Pennsylvania, Schweinitz; North Carolina, Curtis; California, Harkness & Moore; Wisconsin, Bundy; Ohio, in beech woods, Morgan.

13. "*R. VIRESCENS*, (Schæff.) Fr. Hym. Eur., p. 443; Stev., B. F., p. 119; Sacc. Syll., Vol. v., p. 460. Pileus 2–4 inches (5–10 centimeters) broad, green, compactly fleshy, globose then expanded, at length depressed, often unequal, always dry, not furnished with a pellicle, wherefore the *flocculose cuticle is broken up into patches or warts*, margin straight, obtuse, *even*; flesh white, not very compact. Stem 1–2 inches (2.5–5 centimeters) long, $\frac{1}{2}$ inch (12 millimeters) thick, solid, internally spongy, firm, *somewhat rivulose*, white. Gills free, somewhat crowded, sometimes equal, sometimes forked, with a few shorter ones intermixed, *white*.

"Edible. Taste mild. It varies in size and color of pileus, which is sometimes deep, sometimes pallid green, sometimes yellowish, then green. The gills are not so broad in front as those of neighboring species. It is very easily distinguished from all others except *R. crustosa*, by the green pileus being without a pellicle and innato-flocculose, then rivulose, and scaly in the form of patches. In woods. Frequent. July to September.—Stevenson.

"Stem variable in form, slightly reticulated with raised lines. Spores scarcely echinulate, almost globular, 6μ ."—W. G. S. "Name—*Vireo*, to be green. (Fr. Mongr., ii, p. 190; Berk. Out., p. 212, t. 13, f. 6; C. Hbk., n. 632; S. Mycol. Scot., n. 592; Hussey, ii, t. 11; Ag. Schæff., t. 94, excluding f. 1; Vittad., t. 31; Sturm Deutschl. Fl., iii, 3, t. 31; Barla, t. 16, f. 10–12; Ventur., t. 17, f. 1, 2; Krombh., t. 67, f. 1–10.)"—Stevenson.

"Of various livid hues—yellow, purple, and green."—M. J. B.

"Specimens sometimes occur in which the margin is wholly or partly *striate*. The warts are sometimes pale brown."—Peck.

Of this Fries says "*antiquitus edulis*." It is about the best edible mushroom we have, tender and of a fine nutty flavor. Its greenish cap, breaking up into *areas*, distinguishing it from all others except No. 28, *R. crustosa* (also mild), which has the same habit and is sometimes greenish. *R. furcata*, also with a greenish cap, but remaining *smooth*, is easily separated by its bitter taste.

North Carolina and Pennsylvania, common, Schweinitz; North Carolina, Curtis; Massachusetts, Sprague, Farlow, Frost, Palmer; Minnesota, in woods, July, September, Johnson; New York, grassy grounds, June and July, Peck, twenty-fourth and thirty-third reports; Wisconsin, Bundy; Ohio and Kentucky, Morgan; Maryland, sometimes as large as a breakfast plate; Mississippi, Banning; New Jersey, Ellis.

14. "R. LEPIDA, Fr., Hym. Eur., p. 444; Stev., B. F., p. 119; Sacc. Syll., Vol. V, p. 461. Pileus 3 inches (7.5 centimeters) broad, *blood-red rose*, becoming pale, whitish especially at the disk, somewhat equally fleshy, convex then expanded, scarcely depressed, obtuse, opaque, unpolished, *with a silky appearance at length, often rimoso-squamulose*, margin spreading obtuse, without striæ. Stem as much as 3 inches (7.5 centimeters) long, 1 inch (2.5 centimeters) thick; *even, white or rose color*. Gills rounded behind, rather thick, somewhat crowded, often forked, connected by veins, white, often red at the edge. Edible. Taste mild; wholly compact and firm, but the flesh is cheesy, not somewhat grumous. The gills are often red at the edge, chiefly towards the margin, on account of the margin of the pileus being continuous with the gills. In mixed woods. Frequent. September to October.

"Name—*lepidus*, neat, elegant. (Fr. Monogr., ii, p. 191; Sv. ätl. Sv., t. 59; Berk. Out., p. 212; C. Hbk., n. 623; S. Mycol. Scot., n. 593; Hussey, ii, t. 32; Hogg & Johnst., t. 4; Ag. Krombh., t. 64, f. 19, 20; Batsch, t. 13, very small.)"—Stevenson.

Spores 8–10 by 6–8 μ . Sacc. Syll. One of the best edible species. *R. emetica* and *R. rubra* (both poisonous) resemble this, but differ in having the pileus polished. North Carolina, in pine woods, Curtis; Massachusetts, Frost, Palmer; Minnesota, July, August, Johnson; California, Harkness & Moore; Ohio, in beech woods, Morgan; New York, generally with the pileus red, but quite variable in this respect, woods, August. Peck, forty-first Rep.

15. "R. RUBRA, Fr., Hym. Eur., 444, Stev., B. F., p. 120; Cke., iii, 1025; Sacc. Syll., Vol. V, p. 462. Pileus unicoloros, cinnabar-vermilion but becoming pale (tan) when old, disk commonly darker, compact, hard but fragile, convex then flattened, here and there depressed, absolutely dry, *without a pellicle but becoming polished-even*, often rivuloso-rimose when old, margin spreading obtuse, even, always persistent; flesh white, *reddish under the cuticle*. Stem 2-3 inches (5-7.5 centimeters) long; about 1 inch (2.5 centimeters) thick; solid, even, varying white and red. Gills outusely adnate, somewhat crowded, whitish then yellowish, with dimidiate and forked ones intermixed. Very *acid*, very hard and rigid, most distinct from all the others of this group in the *pileus becoming polished-even*, although without a pellicle, in the *flesh being somewhat grumous* and in the *very acid taste*. Gills often red at the edge. In mixed woods. Frequent. August to November. Poisonous. Spores whitish. Fr.; sphaeroid, 8-10 μ . K. Name—*ruber*, red. (Fr., Monogr., ii, p. 191; Sv. ätl. Sv., t. 49; Berk. Out., p. 212; C. Hbk., n. 624; S. Mycol. Scot., n. 594; Ag. Decand—Barla, t. 15, f. 1-10; Krombh., t. 65; Vitt. Mang., t. 38, f. 2, not Bull; Schaeff., t. 15, f. 4-6."—Stevenson. North Carolina, Pennsylvania, Schweinitz; North Carolina, Curtis; New York, July, Peck; Massachusetts, Frost; Minnesota in woods, July and August, Johnson; Wisconsin, Bundy; California, Harkness & Moore; Maryland, Miss Banning.

16. "R. FLAVIDA, Peck, 32d Rep. N. Y. State Mus. Nat. Hist., 1879, p. 32. Pileus fleshy convex, slightly depressed, unpolished, bright yellow; lamellæ white, adnate, turning cinereous; stem yellow, solid, white at the extreme apex."—Frost, M. S.

"Pileus 1-2 inches (2.5-5 centimeters) broad, fleshy, convex, then plane or slightly depressed, yellow, becoming paler with age; flesh white, the margin at first even, then tuberculate-striate; gills nearly simple, subdistant and broader before, adnate, white, the interspaces venose; stem 1-2 inches (2.5-5 centimeters) long, $\frac{1}{3}$ - $\frac{1}{2}$ inch (8-12 millimeters) thick, short, equal or tapering upward, firm, glabrous, solid or merely spongy within, yellow; spores globose, 6-7.5 μ in diameter.

"Taste mild. Gregarious. Grassy places in copses and open woods. Sandlake. July and August. The pileus is dry, and sometimes slightly mealy or granular. When young it is bright yellow; but it fades with age, and sometimes becomes white on the margin."—Peck.

This is one of the species found by Mr. Frost, but never published by him. Massachusetts, Frost; New York, Peck. Thirty-second Report and Bulletin, 1887.

17. "R. CINNAMOMEA, Miss M. E. Banning, Bot. Gaz., Jan., 1881. Pileus 4-6 inches (10-15 centimeters) broad, dry, fleshy, centrally depressed, cinnamon color, rimoso-squamose, the cuticle generally breaking up into flocci or granules; flesh dry, spongy, tinged with ocher. Gills concoloros, narrow, forked, close, sinuate near the margin. Stem 2-3 inches (5-7.5 centimeters) or more long, 1 inch. (2.5 centimeters)

thick, regular, smooth, pallid, blunt, at first stuffed, then hollow; spores globose, 8μ in diameter. Taste acrid. In woods near Baltimore. June and July."—Ban.

IV. HETEROPHYLLÆ.

18. "*R. VESCA*, Fr., Hym. Eur., p. 446; Stev., B. F., p. 122; Sacc. Syll., Vol. V, p. 465. Pileus *red-flesh color, disc darker*, fleshy, slightly firm, plano-depressed, *slightly wrinkled with veins*, with a viscid pellicle, margin at length spreading; flesh cheesy, firm, shining white. Stem *solid*, compact, externally rigid, *reticulated and wrinkled* in a peculiar manner, often attenuated at the base, shining white. Gills adnate, crowded, thin, shining white, with many unequal and forked ones intermixed, but scarcely connected by veins. Of middle stature. Taste mild, pleasant. In mixed woods. Frequent. September to October. Name, *vesco*, to feed. From its edible qualities. (Fr., Monogr., ii, p. 193; Sv. ält. Sv., t. 63; Berk. Out., p. 211; C. Hbk., n. 625; S. Mycol. Scot., n. 596; Hussey, i, t. 89.)"—Stevenson.

An edible species of fine flavor. Its peculiarly reticulated stem will assist in separating it from the noxious *R. rubra* which resembles it in the color of the pileus. California, Harkness & Moore.

19. "*R. CYANOXANTHA*, (Schæff.) Fr., Hym. Eur., p. 446; Stev., B. F., p. 122; Sacc. Syll., Vol. V, p. 465. Pileus 2–3 inches (5–7.5 centimeters) and more broad, *lilac or purplish, then olivaceous-green*, disc commonly becoming pale, often yellowish; *margin commonly azure-blue or livid purple*, compact, convex, then plane, then depressed or infundibuliform, sometimes even, sometimes wrinkled or streaked, viscous, margin deflexed, then expanded, remotely and slightly striate; flesh firm, cheesy, white, commonly reddish beneath the separable pellicle. Stem 2–3 inches (5–7.5 centimeters) long, as much as 1 inch (2.5 centimeters) thick, *spongy-stuffed*, but firm, often cavernous within when old; equal, smooth, *even*, shining white. Gills rounded behind, connected by veins, not much crowded, broad, forked with shorter ones intermixed, shining white.

"Allied to *R. vesca* in its *mild*, pleasant *taste*, and in other respects, but constantly different in the color of the pileus, which is very variable, whereas in *R. vesca* it is unchangeable. The peculiar combination of colors in the pileus, though very variable, always readily distinguishes it. In woods, etc. Common. August to October. Sometimes considerably larger than Fries describes. Name, *κυανος*, blue; *ξανθός*, yellow. From the colors. (Fr., Monogr., ii, p. 194; B. and Br., n. 1131; C. Hbk., n. 626; S. Mycol. Scot., n. 597; Ag. Schæff., t. 93; Krombh., t. 67, f. 16–19; Paul., t. 76, f. 1–3.)"—Stevenson.

"One of the best esculent species. Spores 8–10 by 6–8 μ ," Sacc. Syll. "Intrinsically a margin with a rosy tone, more or less sobered with purple, a pale disk and between the two a dark zone of dull indefinable mixture of neutral green with purple, is the type, and the infinite variety is made up not of any change of colors, but simply of

their intensity."—Cooke. North Carolina and Pennsylvania. Common—Schweinitz.

20. "*R. HETEROPHYLLA*, Fr., Hym. Eur., p. 446; Stev., B. F., p. 123; Sacc. Syll., Vol. V, p. 465. Pileus very variable in color, but *never becoming reddish or purple*, fleshy, firm, convexo-plane, then depressed, *even polished*, the very thin pellicle disappearing, margin thin, even or densely but slightly striate; flesh white. Stem solid, firm, somewhat equal, *even shining white*. Gills *reaching the stem in an attenuated form, very narrow, very crowded*, forked and dimidiate, shining white. Taste *always mild*, as in *R. cyanoxantha*, from which it differs in its smaller stature, in the pileus being thinner, even, *never reddish* or purplish, with a thin, closely adnate pellicle, in the stem being *firm and solid*, and in the gills being *thin, very narrow, very crowded*, etc. The apex of the stem is occasionally dilated in the form of a cup, so that the gills appear remote. In woods. Common. July to October.

"Edible, of a sweet nutty flavor. Spores echinulate, 5 by 7 μ ."—W. G. S. "Name, *Ετερος*, other, *ρόλλον*, a leaf. With gills of different lengths. Fr.,) Monogr., ii, p. 194; Berk. Out., p. 211, t. 13, f. 5; C. Hbk., n. 627; S. Mycol. Scot., n. 598; Hogg. & Johnst., t. 9; Hussey, i, t. 84; Badh., i, t. 10, f. 3; ii, t. 3, f. 3, 4; Ag. Gl. Dan., t. 1909, f. 1; Paul., t. 75, f. 1-5)."—Stevenson.

Of the same edible qualities as the preceding; sometimes of a greenish-gray color. *R. furcata*, the only species of a disagreeable flavor having a green pileus, is distinguished by its uniform color and distant gills, as contrasted with the mottled tints and crowded gills of the former. North Carolina and Pennsylvania, in moist woods (*A. lividus*, Pers.) Schweinitz; California, Harkness and Moore; New York, in woods, August, Peck Thirty-fifth Report; Massachusetts, Palmer.

21. "*R. CONSOBRINA*, Fr., Hym. Eur., p. 447; Stev., B. F., p. 123; Sacc. Syll., Vol. V, p. 466. Pileus 3 inches (7.5 centimeters) broad, *dark-cinereous* or fuscous-olivaceous, fleshy, fragile, campanulate then expanded, at length depressed, margin spreading, even, though membranaceous; *flesh—white, cinereous, under the thick, viscous, separable pellicle*. Stem 2-3 inches (5-7.5 centimeters) long, almost 1 inch (2.5 centimeters) thick, solid, but *soft*, equal, even, smooth, shining, white, *at length becoming cinereous*. Gills at the first free, then appearing adnate when the pileus is flattened, broad, crowded, shining, white, *very many of them dimidiate and forked*. Taste *very acrid*. Not fetid. Stature in general that of *R. emetica*, but differing in the color of the pileus, and in the very unequal gills. In mixed woods. October. Spores granular 10 μ . Q. Name—*consobrinus*, cousin. Distantly related to neighboring species. (Fr., Monogr., ii, p. 195; B. & Br., n. 1676; S. Mycol. Scot., n. 599.)"—Stevenson.

New York. "Our specimens are very variable in color, but the prevailing hues are green, olivaceous, and purple."—Peck. Twenty-sixth Report.

22. "*R. FOETENS*, (Pers.) Fr., Hym. Eur., p. 447; Stev., B. F., p. 124; Sacc. Syll., Vol. V, p. 467. Pileus 4-5 inches (10-12.5 centimeters) and more broad, dingy yellow, often becoming pale, thinly fleshy, at first bullate, then expanded and depressed, covered with a pellicle which is adnate, not separable and viscid in wet weather, margin broadly membranaceous, at first bent inwards *with ribs which are at length tubercular*; flesh thin, *rigid*—fragile, pallid. Stem 2 inches (5 centimeters) and more long, $\frac{1}{2}$ -1 inch (1-2.5 centimeters) thick, stout, stuffed, then hollow, whitish. Gills adnexed, crowded, connected by veins, with very many *dimidiate and forked* ones intermixed, whitish, at first *exuding watery drops*.

"Fetid. Taste acrid. Very rigid, most distinct from all others in its *very heavy empyreumatic odor*. In very dry weather the odor is often obsolete. The margin is more broadly membranaceous and hence marked with *longer furrows* than in any other species. It differs from all the preceding ones in the gills at the first exuding watery drops. The gills become obsoletely light yellow, and dingy when bruised."—Stevenson. "In woods, etc. Very common. July to September. Stem ruggedly hollow within as if eaten by snails."—M. J. B. "A very coarse and easily recognized species. Reckoned poisonous, though eaten by slugs. Spores minutely echinulate, almost globular 8μ ."—W. G. S. "Name—*fœtens*, stinking. (Fr. Mongr., ii, p. 195; Sv. ätl. Sv., t. 40; Berk. Out., p. 213; C. Hbk., n. 628; S. mycol. Scot., n. 600; Ag. Pers.—Krombh., t. 70, f. 1-6; Viv., 41; Bull., t. 292; Ventur., t. 33, f. 1-3.)"—Stevenson.

"Variety *granulata* has the cuticle of the pileus rough with small granular scales."—Peck, Thirty-ninth Report. "The odor of this plant as it occurs with us is not usually fetid or unpleasant. It resembles the odor of cherry bark and might aptly be termed amygdaline, and the same odor has been attributed by one writer at least to the European *R. fœtens*. It is doubtless this form to which Dr. Curtis gave the name *R. amygdalina*. The lamellæ are rarely forked and frequently are quite as equal as in species of the section *Fragiles*."—Peck, Thirty-second Report.

North Carolina and Pennsylvania, plentiful, August, Schweinitz; North Carolina, Curtis; Massachusetts, Sprague, Frost; New York, common in woods and open places, July and August, Peck, Twenty-third Report; Minnesota, July to September, Johnson; Wisconsin, Bundy; Ohio, generally rancid and stinking, sometimes fragrant, common, Morgan; Rhode Island, Bennett.

23. "*R. SIMILLIMA*, Peck, 24th Rep. N. Y. State Mus. Nat. Hist., 1872, p. 75; Sacc. Syll., Vol. V, p. 467; pileus, 1-3 inches (2.5-7.5 centimeters); broad, hemispherical or convex, then expanded, slightly depressed; at first or when moist viscid; the margin at length tuberculate-striate; pale, ochraceous yellow, the disk usually a little brighter colored; gills subequal, reaching the stem, some of them forked behind, venose connected, yellowish from the first; stem 2-4 inches (5-10 cen-

timeters) long, $\frac{1}{3}$ – $\frac{3}{4}$ inch (8–18 millimeters) thick; equal or slightly tapering upward, spongy within, rarely hollow, colored like the pileus, sometimes a little paler; spores, $\frac{1}{3000}$ inch (8 μ) in diameter; taste acrid. Ground in woods.”—Greig. September.

“Allied very closely to *R. foetens*, from which it differs by the absence of any marked odor and the margin not so widely striate. I have never seen it caespitose; not growing in cleared lands.”—Peck. Massachusetts, Frost; Wisconsin, Bundy.

24. “*R. MORGANI*, Sacc. Sylloge, Vol. V, p. 468. (*R. incarnata*, Morgan.) Pileus 3–4 inches (7.5–10 centimeters) broad, fleshy, firm; then very fragile, convexo-umbilicate; then expanded and depressed, moist, sordid, flocculose; the margin acute, not striate; the flesh thin, white. Stem about 2 inches (5 centimeters) long, $\frac{3}{4}$ inch (18 millimeters) thick, solid, nearly equal, white. Gills adnate, distant, broad, and alternate ones dimidiate or mostly very short, white, then pale flesh color. Spores white, oblique, apiculate, smooth; 8–5.5 μ .

“Taste mild. On the ground, under beech trees. July, August. The pileus is at first of a sordid color, brownish on the disk. The whole plant when mature takes on a sordid, fleshy hue, and becomes exceedingly fragile.”—Morg.

Originally published as *R. incarnata* by Prof. A. P. Morgan in The Mycologic Flora of the Miami Valley, Ohio, (Journ. Cinn. Soc. Nat. Hist., April, 1883), but the title being preoccupied it was renamed as above.

25. “*R. VARIATA*, Miss M. E. Banning, Bot. Gaz., Jan., 1881. Pileus 3–4 inches (7.5–10 centimeters) broad, at first globose, then expanded and centrally depressed, smooth, viscid, variable in color and even variegated brownish or pinkish purple, with at times a cast of green; epidermis peels easily; the extreme under margin edged with a delicate line of purple; flesh white, unchanging. Gills white, adnexed, narrow, forked, close. Stem nearly 2 inches (5 centimeters) long, $\frac{3}{4}$ inch (18 millimeters) thick, white, smooth, more or less tapering at the base, spongy within; spores white, echinulate, 7.5 by 7.5 μ . Taste acrid. In woods near Baltimore. July.”—Ban.

(To be continued.)

A NEW MUCRONOPORUS.

(Plate XII.)

By J. B. ELLIS AND B. T. GALLOWAY.

MUCRONOPORUS EVERHARTII. On living trunks of *Quercus nigra*, around Newfield, N. J. Found also by Mr. Everhart at West Chester, Pa., and sent from northern New Jersey by Prof. T. G. Gentry. Pileus dimidiate, zonate unguliform, broadly attached behind, convex above,